

## SPECIFICATION

### CARD EDGE CONNECTOR WITH LATCH

#### BACKGROUND OF THE INVENTION

##### 1. Field of the Invention

**[0001]** The present invention generally relates to a card edge connector, and more particularly to a card edge connector having a latch for locking a complementary electrical card received therein.

##### 2. Description of Related Art

**[0002]** Card edge connectors which electrically connect electrical cards to mother boards within a limited space of a computer or other like electronic device are well known. A conventional card edge connector as shown in U.S. Patent Nos. 5,603,625, 5,634,803, and 5,662,485 generally includes an insulative housing defining a slot for receiving a mating edge of a complementary electrical card and a plurality of passageways on opposite side walls of the slot and communicating with the slot, a plurality of contacts received in the passageways of the insulative housing and having mating portions exposed in the slot for contact with conductive pads on the mating edge of the complementary electrical card, and a pair of ejectors or latch members at opposite ends of the insulative housing for facilely extract the complementary card held in the slot. The ejectors or latch members are provided with locking sections at top ends thereof which are received within correspondingly sized and shaped cutouts in the complementary electrical cards when the ejectors or latch members are in their locked or upright positions.

**[0003]** However, the conventional locking sections are all horizontally received in the cutouts of the complementary electrical cards and are not held in a

reverse direction, the locking sections are apt to disengage from the cutouts, thereby adversely affecting the retention of the electrical cards in the slots of the insulative housings.

**[0004]** Hence, a card edge connector having an improved latch member is desired.

## SUMMARY OF THE INVENTION

**[0005]** An object of the present invention is to provide a card edge connector having a latch which can reliably lock a complementary electrical card.

**[0006]** To achieve the above object, a card edge connector comprises an insulative housing, a plurality of electrical contacts, and a latch member. The insulative housing comprises a mating face, a slot in the mating face, a plurality of passageways communicating with the slot, and a pair of support arms extending upwardly from an end thereof. The electrical contacts are received in the passageways of the insulative housing. The electrical contacts are received in the passageways of the insulative housing. Each latch member is pivotably moveable with respect to the insulative housing from a locked position to a released position and includes a main section pivotably assembled to the arms on the end of the insulative housing and a locking section extending from the main section at an acute angle relative to the mating face of the insulative housing in the locked position.

**[0007]** Other objects, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0008]** FIG. 1 is an exploded perspective view of a card edge connector in accordance with the present invention and a complementary electrical card;

**[0009]** FIG. 2 is an enlarged front plan view of a latch member of the card edge connector of FIG. 1;

**[0010]** FIG. 3 is an assembled perspective view of the card edge connector of FIG. 1 but taken from a different aspect; and

**[0011]** FIG. 4 is a view similar to FIG. 2 but the card edge connector is mated with the complementary electrical card.

## DETAILED DESCRIPTION OF THE INVENTION

**[0012]** Referring to FIG. 1, a card edge connector 1 in accordance with the present invention comprises an insulative housing 10, a plurality of electrical contacts 20, two pairs of retention structures 30 and a pair of latch members 40.

**[0013]** The insulative housing 10 comprises a mating face 11, a mounting face 12 opposite to the mating face 11, a slot 110 extending from the mating face 11 toward the mounting face 12 along a longitudinal direction thereof, a plurality of passageways 112 defined on opposite side walls 111 of the slot 110, a pair of support arms 13 spaced from each other and extending upwardly from each end thereof, and a pair of stand-offs 14 formed on outer sides of each pair of support arms 13. The passageways 112 extend from the mating face 11 to the mounting face 12 and communicate with the slots 110. The two support arms 13 on each end of the insulative housing 10 define a receiving space 130 therebetween and communicating with the slot 110, and a pair of holes 132 in inner sides 131 thereof. A pair of ribs 140 are integrally formed with each support arm 13 and the

corresponding stand-off 14 to increase the mechanical strength of the support arm 13.

**[0014]** Each electrical contact 20 comprises a body portion 21, a mating portion 22 extending upwardly from the body portion 21 and a tail portion 23 extending downwardly from the body portion 21.

**[0015]** Each retention structure 30 comprises a mounting portion 31 and a pair of leg portions 32 extending downwardly from the mounting portion 31 and spaced from each other.

**[0016]** Also referring to FIG. 1 in conjunction with FIG. 2, each latch member 40 comprises an elongated main section 41 having a longitudinal axis A, an eject section 42, an operation section 43 and a locking section 44. The main section 41 defines an inner face 410, an outer face 411 opposite the inner face 410, two opposite side faces 413, and a slit 413 extending from the inner face 410 to the outer face 411 therealong to increase elasticity of the main section 41. The main section 41 is formed with a plurality of projections 414 and a pair of spindles 415 on the opposite side face 412 thereof. The eject section 42 projects inwardly from a lower end of the inner face 410 of the main section 41. The operation section 43 is formed on a top end of the main section 41 and provides a finger shelf on which to push when actuating the latch member 40. The locking section 44 extends inwardly and downwardly from the top end of the main section 41 in a direction B which is at an angle of about seventy-five degrees relative to the axis A of the main section 41. The locking section 44 has an upper face 440, a locking face 441 opposite and substantially parallel to the upper face 440, an end face 442 connecting the upper face 440 with the locking face 441, and a channel 443 defined in the end face 442 and extending from the upper face 440 to the locking face 441. The locking face 441 of the locking section 44 is in a plane C which is also at an angle of about seventy-five degrees relative to the axis of the main section 41. The channel 443

divides a free end of the locking section 44 into two end pieces 444.

**[0017]** Referring to FIG. 3, in assembly, the electrical contacts 20 are received in the passageways 112 of the insulative housing 10 with the mating portions 22 exposed in the slot 110 and the tail portions 23 extending downwardly beyond the mounting face 12 of the insulative housing 10. The retention members 30 are retained to the insulative housing 10 by the mounting portions 31 interferentially engaging with the stand-offs 14 of the insulative housing 10. The leg portions 32 extend downwardly beyond the mounting face 12 of the insulative housing 10 for inserting into holes of a printed circuit board (not shown) on which the card edge connector 1 is mounted. The latch member 40 is assembled to the insulative housing 10 by the spindles 415 being pivoted in the holes 132 in the inner sides 131 of the two support arms 13 on each end of the insulative housing 10. When the latch member 40 is located in its locked or upright position, the mating section 41 is received in the receiving space 130 between the two support arms 13, the direction B in which the locking section 44 extends and the plane C in which the locking face 441 of the locking section 44 is located are at an angle of about fifteen degrees relative to the mating face 11 of the insulative housing 10. Each latch member 40 can rotate outwardly from its locked or upright position to its released position around the corresponding spindles 415.

**[0018]** Further referring to FIG. 1, an electrical card 50 for mating with the card edge connector 1 comprises a mating edge 51, a pair of latch edges 52 and two opposite side faces 53. Each latch edge 52 defines an end face 522 and a cutout 520 having an engaging face 521 which is at angle of about seventy-five degrees relative to the end face 522.

**[0019]** Referring to FIG. 4, when the mating edge 51 of the electrical card 50 is fully inserted into the slot 110 of the insulative housing 10, the latch members 40 rotate to their locked or upright positions. The locking sections 44 are received in

the cutouts 520 on the latch edges 52 of electrical card 50 with the locking faces 441 abutting against the engaging faces 521 of the cutouts 520. The two end pieces 444 on the free end of the locking section 44 clamp the two side faces 53 of the electrical card 50.

**[0020]** Since the locking face 441 of the locking section 44 and the engaging face 521 of the corresponding cutout 520 is at angle of about fifteen degrees relative to the mating face 11 of the insulative housing 10 when the latch member 40 is located in its locked or upright position, the engaging face 521 can prevent the locking section 44 from disengaging from the cutout 520 of the latch edge 52. In addition, the two pieces 444 on the free end of the locking section 44 clamp the two side faces 53 of the electrical card 50, so the electrical card 50 can be prevented from moving transversally, whereby the electrical card 50 can be stably held in the slots 110 of the insulative housing 10 to secure a reliable electrical connection between the card edge connector 1 and the electrical card 50.

**[0021]** It should be noted that the direction B in which the locking section 44 of the latch member 40 and the locking face 441 of the locking section 44 extend can be at an acute angle of zero-ninety degrees to the mating face 11 of the insulative housing 10 when the latch member 40 is located in its locked or upright position, and the engaging face 521 of the cutout 520 of the electrical card 50 is at the same angle to the mating face 11 of the insulative housing 10 when the mating edge 51 of the electrical card 50 is inserted into the slot 110 of the insulative housing 10.

**[0022]** It is to be understood, however, that even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size, and arrangement of parts within the principles

of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.